FREQUENTLY ASKED QUESTIONS about TULAREMIA

Q. What is tularemia?
A. Tularemia, also known as "rabbit fever," is an infectious disease caused by a hardy bacterium, *Francisella tularensis*. It is typically found in animals (especially rodents, rabbits, and hares). Tularemia is a rural disease and occurs in all states except Hawaii.

Q. How do people become infected with the tularemia bacteria?
A.Typically, persons become infected through the bites of arthropods (most commonly, ticks and deerflies), by handling infected animal carcasses, by eating or drinking contaminated food or water, or by inhaling infected aerosols.

Q. Does tularemia occur naturally in the United States?
A.Yes. It is a widespread disease of animals. Approximately 200 cases of tularemia in humans are reported annually in the United States, mostly in persons living in the south-central and western states. Nearly all cases occur in rural areas and are associated with the bites of infective ticks and biting flies or with the handling of infected rodents, rabbits, or hares. Occasional cases result from inhaling infectious aerosols and from laboratory accidents.

Q. What are the signs and symptoms of tularemia?
A. Depending on the route of exposure, the tularemia bacteria may cause skin ulcers, swollen and painful lymph glands, inflamed eyes, sore throat, oral ulcers, or pneumonia.

Early symptoms almost always include the abrupt onset of fever, chills, headache, muscle aches, joint pain, dry cough, and progressive weakness. Persons with pneumonia can develop chest pain, difficulty breathing, bloody sputum, and respiratory failure. Some persons with the lung and systemic forms of the disease may die if they are not treated with appropriate antibiotics.

Q. What should someone do if they suspect they or others have been exposed to the tularemia bacteria?
A. Seek prompt medical attention. If a person has been exposed to *Francisella tularensis*, treatment with antibiotics for 10-14 days or more after exposure may be recommended.

Local and state health departments should be immediately notified so an investigation and control activities can begin quickly.

Q. How is tularemia diagnosed?
A. When tularemia is clinically suspected, the healthcare worker will collect specimens, such as blood or sputum, from the patient for testing in a diagnostic or reference laboratory. Laboratory test results for tularemia may be presumptive or confirmatory.

Presumptive (preliminary) identification may take less than 2 hours, but confirmatory testing will take longer, usually 24 to 48 hours but sometimes a week or more.

Q. Can tularemia be effectively treated with antibiotics?
A. Yes. After potential exposure or diagnosis, early treatment is recommended with an antibiotic from the tetracycline (such as doxycycline) or fluoroquinolone (such as ciprofloxacin) class, which are taken orally, or the antibiotics streptomycin or gentamicin, which are given intramuscularly or intravenously.

Q. How long can Francisella tularensis exist in the environment?
A. *Francisella tularensis* can remain alive for weeks in water and soil.

Q. What is the potential for tularemia as a biological weapon?

A. *Francisella tularensis*, the organism that causes tularemia, is one of the most infectious pathogenic bacteria known, requiring inoculation or inhalation of as few as 10 organisms to cause disease. It is consider ed to be a dangerous potential biological weapon because of its extreme infectivity, ease of dissemination, and substantial capacity to cause illness and death.

During World War II, the potential of *F. tularensis* as a biological weapon, was studied by the Japanese as well as by the US and its allies.

Tularemia was one of several biological weapons that were stockpiled by the US military in the late 1960's, all of which were destroyed by 1973. The Soviet Union continued weapons production of antibiotic and vaccine resistant strains into the early 1990s.

Francisella tularensis is a hardy non-spore forming organism that is capable of surviving for weeks at low temperatures in water, moist soil, hay, straw or decaying animal carcasses.

F. tularensis has been divided into two subspecies: *F. tularensis* biovar tularensis (type A), which is the most common biovar isolated in North America and may be highly virulent in humans and animals; *F. tularensis* biovar palaearctica (type B) which is relatively avirulent and thought to the cause of all human tularemia in Europe and Asia.

Tularemia is a zoonosis. Natural reservoirs include small mammals such as voles, mice, water rats, squirrels, rabbits and hares. Naturally acquired human infection occurs through a variety of mechanisms such as: bites of infected arthropods; handling infectious animal tissues or fluids; direct contact or ingestion of contaminated water, food, or soil; and inhalation of infective aerosols. *F. tularensis* is so infective that examining an open culture plate can cause infection.

Aerosol dissemination of *F. tularensis* in a populated area would be expected to result in the abrupt onset of large numbers of cases of acute, non-specific febrile illness beginning 3 to 5 days later (incubation range, 1-14 days), with pleuropneumonitis developing in a significant proportion of cases over the ensuing days and weeks. Without antibiotic treatment, the clinical course could progress to respiratory failure, shock and death.

The overall mortality rate for severe Type A strains has been 5-15%, but in pulmonic or septicemic cases of tularemia without antibiotics treatment the mortality rate has been as high as 30-60%. With treatment, the most recent mortality rates in the US have been 2%. Aminoglycosides, macrolides, chloramphenicol and fluoroquinolones have each been with used with success in the treatment of tularemia.

In the United States, a live-attenuated vaccine derived from the avirulent Live Vaccine Strain (LVS) has been used to protect laboratory personnel routinely working with *F. tularensis*. Given the short incubation period of tularemia and incomplete protection of current vaccines against inhalational tularemia, vaccination is not recommended for post-exposure prophylaxis.

Given the lack of human-to-human transmission, isolation is not recommended for tularemia patients.

The Working Group lacks information on survival of intentionally-dispersed particles, but would expect a short half-life due to dessication, solar radiation, oxidation and other environmental factors, and a very limited risk from secondary dispersal.

Simple, rapid and reliable diagnostic tests that could be used to identify persons infected with *F. tularensis* in the mass exposure setting need to be developed. Research is also needed to develop accurate and reliable proced-ures to rapidly detect *F. tularensis* in environmental samples.

(above information is from The Johns Hopkins University on behalf of its Center for Civilian Biodefense Studies)